**Application No.: 10/774,577** Docket No.: 8650.027 US Amdt. dated August 3, 2011

Reply to Office Action dated May 4, 2011

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

## **Listing of Claims:**

1. (Currently Amended) An electroluminescent device comprising a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element includes a fluorescent 1,1'-binaphthyl derivative represented by Formula (I):

Formula (1)

wherein R<sub>1</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof; and R2 and R3 are individual substituents or a group of substituents, each of which is selected from the group consisting of alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a

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fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, pyridyl or quinolinyl; an alkoxy, amino, or alkyl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof, wherein if one of  $R_2$  and  $R_3$  is a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, or pyridyl, then the other of  $R_2$  and  $R_3$  is also a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, or pyridyl, and wherein when  $R_1$  and  $R_4$  are both hydrogen and  $R_2$  and  $R_3$  are both aryls, then  $R_2$  and  $R_3$  are located at position 4,4 of formula I and are selected from the group consisting of tolyl, naphthyl, anthryl, phenylanthryl, diphenylanthryl, biphenylyl, perylene, furyl, thienyl, pyridyl, trimethylsilyl and triphenylsilyl.

- 2. (Original) An electroluminescent device in accordance with claim 1 wherein said electroluminescent element includes an emitting layer comprised of a host 1,1'-binaphthyl derivative comprised of Formula (I) and a guest fluorescent or phosphorescent dye.
- 3. (Original) An electroluminescent device in accordance with claim 2 wherein said fluorescent or phosphorescent dye possesses a bandgap no greater than that of said host material.
- 4. (Original) An electroluminescent device in accordance with claim 2 wherein said fluorescent or phosphorescent dye is present in a concentration of from about 0.01 to about 10 mole percent, based on the moles of said 1,1'-binaphthyl derivative host material.
- 5. (Original) An electroluminescent device in accordance with claim 1 wherein said element is a layer, said first electrode is an anode, and said second electrode is a cathode.
- 6. (Previously Presented) An electroluminescent device in accordance with claim 1 wherein said element is comprised of a layered electroluminescent arrangement comprised of a hole transport layer, and a light emitting layer wherein 1,1'-binaphthyl derivatives are added thereto, and an electron transport layer; and which element is positioned between said first and second electrodes.

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7. (Original) An electroluminescent device in accordance with claim 1 wherein said element represents a single layer, a plurality of layers, or a plurality of laminated layers.

8. (Currently Amended) An electroluminescent device comprising a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element includes a fluorescent 1,1'-binaphthyl derivative represented by Formula (II):

$$R_1$$
 $R_2$ 
 $R_3$ 
 $R_4$ 

Formula (II)

wherein R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano, group, and combinations thereof; and R<sub>5</sub> and R<sub>6</sub> are substituents selected from the group consisting of an aryl or substituted aryl with about 6 to about 30 carbon atoms; a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, pyridyl or quinolinyl; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; a silicon atom which can be substituted with a trimethyl; diphenylmethyl, triphenyl

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group; and combinations thereof, wherein if one of  $R_5$  and  $R_6$  is a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, or pyridyl, then the other of  $R_5$  and  $R_6$  is also a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, or pyridyl, and wherein when  $R_1$ - $R_4$  are hydrogen and  $R_5$  and  $R_6$  are both aryls, then  $R_5$  and  $R_6$  are selected from the group consisting of tolyl, naphthyl, anthryl, phenylanthryl, diphenylanthryl, biphenylyl, perylene, furyl, thienyl, pyridyl, trimethylsilyl and triphenylsilyl.

9. (Currently Amended) An electroluminescent device in accordance with claim 8 wherein said R<sub>5</sub> and R<sub>6</sub> are selected from the group consisting of phenyl, tolyl, naphthyl, anthryl, phenylanthryl, diphenylanthryl, biphenylyl, phenylvinyl, diphenylvinyl, perylene, furyl, thienyl, pyridyl, trimethylsilyl and triphenylsilyl.

10. (Withdrawn) An electroluminescent device comprising a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element includes a fluorescent 1,1'-binaphthyl derivative represented by Formula (III):

Formula (III)

wherein R1 and R4 are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl

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cyano group; and combinations thereof.

group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof; R2 and R3 are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof; and R7 and R8 are substituents selected from the group consisting of alkyl of from 1 to about 25 carbon atoms; a halogen, a

- 11. (Withdrawn) An electroluminescent device in accordance with claim 10 wherein said R7 and R8 are selected from the group consisting of methyl, ethyl, methoxy, ethoxy, isopropoxy, butoxy, dimethylamino, diethylamino, fluorine, chlorine, bromine and cyano.
- 12. (Withdrawn) An electroluminescent device comprised of a first electrode, an organic electroluminescent element, and a second electrode wherein said electroluminescent element contains a fluorescent 1,1'-binaphthyl derivative represented by Formula (IV):

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Formula (IV)

wherein R1, R2, R3 and R4 are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof; and R5 and R6 are substituents selected from the group consisting of an aryl or substituted aryl with about 6 to about 30 carbon atoms; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and triazinyl; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; and combinations thereof; and R7 and R8 are substituents selected from the group consisting of alkyl of from 1 to about 25 carbon atoms; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group; and combinations thereof.

13. (Original) An electroluminescent device comprised of a first electrode, an organic luminescent element, and a second electrode wherein said electroluminescent element contains a 1,1'-binaphthyl derivative selected from the group consisting of 4,4'- pheny1-1,1'-binaphthyl,

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4,4'-(4-t-butylpheny1)-1,1'-binaphthyl, 4,4'-(2-naphthyl)-1,1'-binaphthyl, 4,4'-(1-naphthyl)-1,1'-binaphthyl, 4,4'-anthracene-1,1'-binaphthyl, 4,4'-triphenylsily1-1,1'-binaphthyl, and 2,2'-methoxy-6,6-phenyl-1,1'-binaphthyl.

14. (Currently Amended) An organic electroluminescent device comprising in the following sequence an anode, an optional buffer layer, a hole transporting layer, a light emitting layer comprised of a 1,1 '-binaphthyl derivative of Formula (I), an electron transport layer, and a cathode, wherein Formula (I) is:

wherein R<sub>1</sub> and R<sub>4</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of hydrogen; alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; heteroaryl or substituted heteroaryl of from 5 to 24 carbon atoms, carbon atoms necessary to complete a fused heteroaromatic ring of furyl, thienyl, pyridyl, quinolinyl and other heterocyclic systems; an alkoxy, amino, alkyl amino or aryl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof; and R<sub>2</sub>, and R<sub>3</sub> are individual substituents or a group of substituents, each of which is selected from the group consisting of alkyl of from 1 to about 25 carbon atoms; an alicyclic alkyl of from 3 to 15 carbon atoms; an aryl or substituted aryl with about 6 to about 30 carbon atoms; carbon atoms from 4 to 24 necessary to complete a fused aromatic ring of naphthalene, anthracene, perylene; an alicyclic alkyl group

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with from about 3 to about 15 carbon atoms; a silicon atom which can be substituted with a trimethyl, diphenylmethyl, triphenyl group; a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, pyridyl, or quinolinyl; an alkoxy, amino, or alkyl amino of from 1 to about 25 carbon atoms; a halogen, a cyano group, and combinations thereof, wherein if one of R<sub>2</sub> and R<sub>3</sub> is a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, or pyridyl, then the other of R<sub>2</sub> and R<sub>3</sub> is also a substituted or unsubstituted heteroaromatic ring of furyl, thienyl, or pyridyl, and wherein when R<sub>1</sub> and R<sub>4</sub> are both hydrogen and R<sub>2</sub> and R<sub>3</sub> are both aryls, then R<sub>2</sub> and R<sub>3</sub> are located at position 4,4 of formula I and are selected from the group consisting of tolyl, naphthyl, anthryl, phenylanthryl, diphenylanthryl, biphenylyl, perylene, furyl, thienyl, pyridyl, trimethylsilyl and triphenylsilyl.

15. (Original) An electroluminescent device in accordance with claim 14 wherein said light emitting layer further comprises a fluorescent or phosphorescent dye.

16. (Original) An electroluminescent device in accordance with claim 14 wherein said anode is comprised of indium tin oxide in a thickness of from about 1 to about 500 nanometers; said buffer layer is comprised of a phthalocyanine derivative in a thickness of from, about 5 to about 80 nanometers, said hole transport layer is comprised of a tertiary aromatic amine in a thickness of from about 5 to about 300 nanometers; said light emitting layer is of a thickness of about 5 to about 300 nanometers, and said cathode is comprised of a magnesium silver alloy or a lithium aluminum alloy in a thickness of from about 10 to about 800 nanometers.

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